WHAT IS CLAIMED IS:

1. A system operable to use a ping-pong protocol in order to remain as flexible as possible during traffic allocation, the system comprising:

a first unit; and

a second unit, wherein the first unit is operable to transmit a first packet including a first length indicator toward the second unit, and wherein the second unit is operable to receive the first packet and then is operable to transmit a second packet including a second length indicator towards the first unit.

2. A system operable to use a ping-pong protocol in order to remain as flexible as possible during traffic allocation, the system comprising:

a first unit having a first address;

a second unit having a second address; and

a third unit having a third address, wherein the first unit is operable to transmit a first packet including a first length indicator toward the second unit or the third unit, and wherein at least one of the second unit and the third unit is operable to receive the first packet and then is operable to, upon receipt of the first packet, transmit a second packet including a second length indicator.

3. The system of claim 1 or claim 2 wherein the units are further operable to use a selective-repeat ARQ scheme.

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4. The system of Claim 1 or claim 2 wherein the units continue to transmit and receive additional packets, each of which has a length indicator.

5. The system of claim 4 wherein the first packet, the second packet and the additional packets each start at a respective slot boundary within a slotted time division duplex communication channel.

6. The system of claim 2 wherein each of the packets includes an address of one of the units, the address being used to determine to which of the units each of the packets is transmitted toward.

7. The system of claim 1 or claim 2 wherein the first unit is assigned a master unit role and is further operable to restart transmission operations using priority slots.

8. The system of claim 7 wherein the priority slots have an interval that may be dynamically increased or dynamically decreased depending on error conditions.

9. The system of claim 1 wherein the first unit is further operable to restart transmission operations using first priority slots, and the second unit is further operable to restart transmission operations using second priority slots.

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10. The system of claim 2 wherein the first unit is further operable to restart transmission operations using first priority slots, and the second unit is further operable to restart transmission operations using second priority slots.

11. The system of claim 9 or claim 10 wherein an interval of the first priority slots is less than an interval of the second priority slots.

12. The system of claim 10 wherein the third unit is further operable to restart transmission operations using third priority slots.

13. The system of claim 12 wherein an interval of the first priority slots is less than an interval of the second priority slots and is less than an interval of the third priority slots.

14. The system of claim 12 wherein the first priority slots and the second priority slots both have the same intervals but are time-staggered.

15. The system of claim 14 wherein the third priority slots have the same intervals as the first priority slots and the second priority slots, but the first priority slots, the second priority slots, and the third priority slots are time-staggered from one another.

16. The system of claim 15 wherein the first priority slots have intervals that may be dynamically increased or dynamically decreased depending on error conditions.

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~~17. A method for using a ping-pong protocol to enable flexible traffic allocation between a first unit and a second unit, the method comprising the steps of:~~

~~transmitting from the first unit a first packet including a first length indicator;~~

~~receiving the first packet at the second unit;~~

~~transmitting from the second unit a second packet including a second length indicator; and~~

~~receiving the second packet at the first unit.~~

18. A method for using a ping-pong protocol to enable flexible traffic allocation among a first unit, a second unit, and a third unit, the method comprising the steps of:

transmitting from the first unit a first packet including a first length indicator, the packet being directed toward the second unit, the second unit being identified in the first packet;

receiving the first packet at the second unit; and

transmitting from the second unit a second packet including a second length indicator.

19. The method of claim 18 wherein the second packet is directed toward the first unit, the first unit being identified in the second packet.

20. The method of claim 19 further comprising the step of receiving the second packet at the first unit.

21. The method of claim 20 wherein each of the packets includes an address of one of the units, the address being used to determine to which of the units each of the packets is directed toward.

22. The method of claim 18 wherein the second packet is directed toward the third unit, the third unit being identified in the second packet.

23. The method of claim 22 further comprising the step of receiving the second packet at the third unit.

24. The method of claim 23 wherein each of the packets includes an address of one of the units, the address being used to determine to which of the units each of the packets is directed toward.

25. The method of claim 18, further comprising the step of using a selective-repeat scheme among the units.

26. The method of claim 25, further comprising the steps of restarting transmission operations within the first unit at first priority slots, and restarting transmission operations within the second unit at second priority slots.

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27. The method of claim 26, further comprising the steps of restarting transmission operations within the third unit at third priority slots.

28. The method of claim 27 wherein the first priority slots, the second priority slots, and the third priority slots each have the same intervals but are time-staggered.

29. The method of claim 28 wherein the first priority slots, the second priority slots, and the third priority slots each have intervals that may be dynamically increased or dynamically decreased depending on error conditions.

30. The method of claim 25 wherein the first priority slots and the second priority slots both have the same intervals but are time-staggered.

31. The method of claim 30 wherein the first priority slots and the second priority slots both have intervals that may be dynamically increased or dynamically decreased depending on error conditions.

32. The method of claim 17 or claim 18, further comprising the step of continuing the steps of transmitting and receiving among the units using additional packets, each of which has a length indicator.

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33. The method of claim 32, further comprising the steps of starting the transmission of each of the first packet, the second packet, and the additional packets at a slot boundary within a slotted time division duplex communication channel.

34. The method of claim 17 or claim 18, further comprising the steps of assigning a master unit role to the first unit and restarting transmission operations within the first unit at priority slots.

35. The method of claim 34 wherein the priority slots have an interval that may be dynamically increased or dynamically decreased depending on error conditions.

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36. A system operable to use a selective-repeat ARQ scheme to provide data integrity in an error-prone communications environment, the system comprising:

a first unit; and

a second unit, wherein the first unit is operable to transmit a first packet including at least one segment towards the second unit, and wherein the second unit is operable to receive all or a portion of the first packet and then is operable to transmit a second packet including acknowledgment information indicating which, if any, of the at least one segment were successfully received by the second unit.

37. The system of claim 36 wherein the first unit and the second units are further operable to use a ping-pong protocol.

38. The system of claim 36 wherein the first unit retransmits at least one of the previously transmitted segments and transmits, if needed, additional segments in a third packet based on the acknowledgment information.

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39. The system of claim 36 wherein a round-trip delay between the transmission of the first packet and the reception of the second packet is variable and depends on a size of the first packet and a size of the second packet.

40. The system of claim 36 wherein the size of the first packet or the size of the second packet is no larger than the smaller of a transmit buffer and a receive buffer in each of the first and second units.

41. The system of claim 36 wherein another selective-repeat ARQ scheme works for communications on a link from the second unit to the first unit.

42. The system of claim 36 wherein each segment further includes a distinctive sequence number.

43. The system of claim 39 wherein the acknowledgment information further includes a CUM_ACK field which indicates, using a sequence number, which sequential segments have been successfully received by the second unit.

44. The system of claim 40 wherein the acknowledgment information further includes a Bit Map (BMS) field which indicates the segments with sequence numbers greater than a Request Number that have failed and which have been successfully received by the second unit.

45. The system of claim 36 wherein the second unit is further operable to remove, from a receive buffer, the sequential segments that have been successfully received.

46. The system of claim 36 wherein the segments that are not successfully received by the second unit can be repeatedly retransmitted with a decreasing repetition interval.

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~~47. A method for using a selective-repeat ARQ scheme to provide data integrity in communications between a first unit and a second unit, the method comprising the steps of:~~

~~transmitting from the first unit a first packet including at least one segment and receiving all or a portion of the first packet at the second unit; and~~

~~transmitting from the second unit a second packet including acknowledgment information indicating which, if any, of the at least one segment were successfully received by the second unit.~~

48. The method of claim 47 wherein the first and second units are further operable to use a ping-pong protocol.

49. The method of claim 47 wherein a length indicator included in each of the packets is used to determine when a next packet can be sent.

50. The method of claim 47 further comprising the step of transmitting by the first unit of a third packet to the second unit, a number of segments in the third packet being determined based on the acknowledgment information.

51. The method of claim 50 wherein the acknowledgment information enables a determination of a fullness of a receive buffer of the second unit.

52. The method of claim 51 wherein the first unit transmits only segments that can be accepted by the receive buffer of the second unit.

53. The method of claim 48 wherein segments transmitted in the third packet include only segments indicated by the acknowledgment information as having not been received by the second unit in the first packet and any additional segments that can be accepted by a receive buffer of the second unit.

54. The method of claim 47 further comprising the steps of retransmitting from the first unit at least one of the previously transmitted segments and transmitting, if needed, additional segments in a third packet based on the acknowledgment information.

55. The method of claim 54 wherein a round-trip delay between the transmission of the first packet and the reception of the second packet is variable and depends on a size of the first packet and a size of the second packet.

56. The method of claim 55 wherein the size of the first packet or the size of the second packet is no larger than the smaller of a transmit buffer and a receive buffer in each of the first and second units.

57. The method of claim 47 wherein another selective-repeat ARQ scheme works for communications on a link from the second unit to the first unit.

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58. The method of claim 47 wherein each segment further includes a distinctive sequence number.

59. The method of claim 58 wherein the acknowledgment information further includes a CUM_ACK field which indicates, using a sequence number, which sequential segments have been successfully received by the second unit.

60. The method of claim 59 wherein the acknowledgment information further includes a Bit Map (BMS) field which indicates the segments with sequence numbers higher than a Request Number that have failed and which have been successfully received by the second unit.

61. The method of claim 47 wherein the second unit is further operable to remove, from a receive buffer, the sequential segments that have been successfully received.

62. The method of claim 47 wherein the segments that are not successfully received by the second unit are repeatedly retransmitted with a decreasing repetition interval.

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